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NOISE

ELEMENT

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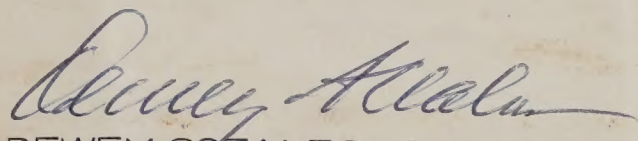
Noise abatement

Bakersfield

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DEWEY SCALES, Secretary of Planning
Commission and Planning Director

NOISE ELEMENT

A. INTRODUCTION

Noise levels have been increasing in communities for several years. Rapid population growth and urbanization has resulted in a growing demand for automobiles, recreational vehicles, electrical appliances, and other noise generating equipment. All of these have contributed to the increase of ambient noise levels within the urban environment.

Various governmental agencies carry out programs to abate or minimize excess noise--both in terms of fixed and mobile sources. These programs are cited in the JURISDICTIONAL RESPONSIBILITY IN NOISE CONTROL SECTION.

The California Legislature enacted new legislation in 1972 requiring cities and counties to adopt Noise Elements as part of their local general plans. (Government Code Section 65302 (g)). The Noise Element is intended to be a local strategy for achievement of acceptable noise standards through land use and transportation planning practices, and techniques of local noise abatement not now preempted by other jurisdictional authority.

This Noise Element has been prepared in compliance with Section 65302 (g) of the Government Code and guidelines issued by State of California, Council on Intergovernmental Relations. It is concerned with improving the existing environment within the City of Bakersfield, as it relates to noise, and minimizing the adverse influences of noise which may result from future urban development.

B. ACKNOWLEDGEMENTS AND REFERENCES

A variety of sources were used in preparation of this Noise Element. In general, it is a summary and adaptation of the Noise Element study conducted under the auspices of the Kern County Council of Governments. Special credit is given to:

Kern County Health Department

- Owen A. Kearns, M.D., Health Officer
- Vernon S. Reichard, M.P.H., Director of Environmental Health Services
- Jim Buntin, R.D., Project Coordinator

KernCOG

- Brad Williams

In addition, we would like to thank the staff at the California Department of Transportation, and the Santa Fe and Southern Pacific Railroads which provided local governments with noise level data related to their facilities.

Without the help of these individuals and organizations the preparation of this Noise Element would have been much more difficult and certainly more expensive.

C. SUMMARY OF RECOMMENDATIONS

Objective

Improve and maintain an acceptable total noise environment to minimize disruption of human activities and reduce social conflicts; to maintain property values, and consequently, the economic base of the community; and to protect the public health, welfare, and safety.

Recommendations

1. Continue to enforce existing laws to limit noise of on- and off-road vehicles, and disturbance of the peace.
2. Consider the possible impacts of noise as an integral part of the transportation planning process.

When planning new routes, noise considerations should influence route selection; and design factors such as rights-of-way widths, grades, elevations, buffering setbacks, truck routing, and speed limits.

When dealing with noise impacts from existing transportation systems consideration should be given to development of noise barriers and noise insulation of affected uses, particularly schools. Funding such remedial programs may remain a problem, however.

3. Continue to enforce codes which require noise insulation of residential uses within noise impacted areas. Such codes now in effect include Section 1092 of The California Administrative Code, Title 25; and the 1973 Uniform Building Code, Chapter 35 Appendix.

4. Minimize noise impacts on the community through land use and site planning process. When proposals for re-zoning or subdivisions (discretionary acts) are submitted, noise effects should be considered as part of the environmental assessment process. Building sound insulation techniques should be considered appropriate mitigation measures.



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D. WHAT IS NOISE?

Noise may be defined as unwanted sound that is disruptive to an individual's environment. Sound is transmitted by waves of pressure; sound frequencies or pitch are determined by the number of cycles of sound waves per second.

The volume of sound is measured in decibels, which is a logarithmic unit of measurement. That is, as a sound level is increased by 20 decibels the "power" is increased by a multiplier of 100.

When noise from more than one source is being generated simultaneously, the approximate decibel value of the combined noise sources can be obtained by using this decibel addition chart.

<u>When two decibel values differ by</u>	<u>Add the following amount to the higher value</u>
0 or 1 dB	3 dB
2 or 3 dB	2 dB
4 to 9 dB	1 dB
10dB or more	0 dB

That is, $50 \text{ dBA} + 50 \text{ dBA} = 53 \text{ dBA}$
 $50 \text{ dBA} + 50 \text{ dBA} + 50 \text{ dBA} = 55 \text{ dBA}$
 $50 \text{ dBA} + 54 \text{ dBA} = 55 \text{ dBA}$

Our daily environment is filled with differing levels of sound. We know through scientific investigation that: noise over 140 dBA will cause physical injury; noise over 65 dBA interferes with normal conversation and brief high peak levels of noise are not as hazardous to our well-being as a lower steady level.

EXAMPLES OF VARIOUS NOISE LEVELS

<u>Decibels</u>	<u>Example</u>
140	Jet Plane
100	Pneumatic Drill
85	Average Factory
80	Noisy Restaurant
75	Busy Traffic
65	Conversational Speech
50	Average Home
35	Optimal Sleeping Level

Many people dealing with noise measurement may be confused, if not annoyed, by differing noise measurement scales. It makes it more difficult for planning purposes, but the differing scales are with us. Two noise measurement scales have been used within the context of this study. The noise levels indicated on the Noise Contour Map are the Community Noise Equivalent Level (CNEL), used for airport and railroad lines, and Day-Night Average Sound Level (L_{dn}), used for streets, highways, and railroad yards. A brief description of the differences and similarities of these two scales are as follows:

1. Community Noise Equivalent Level (CNEL).

This is a measure of the cumulative noise exposure in the community, with greater weights applied to evening and nighttime periods. For CNEL calculations, day is defined as 7 a.m. to 7 p.m., and this period has a weighting factor of one; evening is 7 p.m. to 10 p.m. and has a weighting factor of three; and night is from 10 p.m. to 7 a.m. and has a weighting factor of ten. Noise levels occurring at night are given a substantially heavier weight

because this is the time when noise is most disturbing to most people.

2. Day-Night Average Sound Level (L_{dn})

This measurement is essentially the same as CNE_L except that the evening time period is not considered separately, but is instead included as part of the daytime period. Noise contours developed using CNE_L and L_{dn} procedures will usually differ by only one decibel, an insignificant difference. The L_{dn} scale is much simpler to compute and is used by the Kern County Health Department. It is also recommended by the U. S. Environmental Protection Agency for nationwide use.

E. JURISDICTIONAL RESPONSIBILITY IN NOISE CONTROL

The kinds of things local governments can do to control unwanted noise is limited. Federal and State authority has preempted that of local government in a number of areas. The following briefly summarizes the jurisdictional authority of various levels of government in the field of noise control.

1. Federal Noise Control Activity

The Noise Control Act (NCA) of 1972 includes a number of provisions to control the extent of noise where the Federal Government has authority. It states that the Environmental Protection Agency (EPA) shall propose noise control regulations for aircraft and asserts that EPA and the Federal Aeronautics Administration preempts local control over aircraft noise. In addition, NCA 1972 states that regulations related to noise from surface carriers and motor vehicles engaged in interstate commerce is a Federal responsibility. NCA 1972 also gives EPA authority to prescribe noise standards for new products including construction equipment, transportation equipment, any motor or engines and electric or electronic equipment. Noise emitting or noise abating equipment is to be labeled.

The Federal Aid Highway Act (1973) directs the Secretary of Transportation to make standards for highway noise control. The Walsh Healy Act applies noise standards to Federal contracts. Finally, the Occupational Health and Safety Administration (OSHA) applies noise standards to businesses affecting interstate commerce.

2. California Noise Control Activity

The California Public Utilities Code provides noise standards to protect people from aircraft noise and to resolve problems between airports and neighboring areas, to the extent not already limited by Federal law. The State Department of Aeronautics requires noise monitoring at airports, mapping of noise impact boundaries, and the preparation of land use recommendations for all Airport Influence Areas. Such recommendations are to be formulated by Airport Land Use Commissions (required in each county) and sent to each concerned local agency.

The Department of Aeronautics has indicated that the following uses are compatible within airport "noise impact boundaries":

- a. Agricultural, airport industrial, and commercial property.
- b. Property subject to aviation easements for noise.
- c. Zoned open space.
- d. High-rise apartments with adequate insulation and central air conditioning.
- e. Acoustically treated single-family homes (existing airports only).

The California Motor Vehicle Code regulates noise limits for new vehicles and all registered motor vehicle operations. The Harbors and Navigation Code regulates noise emission from motorboats in or upon inland waters. The Streets and Highways Code requires consideration of noise impacts when locating freeways; if the noise level would exceed the established standard the state would be responsible for noise abatement in the

affected school rooms. The Division of Industrial Safety publishes noise regulations for industries subject to State control.

The Penal Code contains nuisance provisions, prohibiting loud and unusual noise that disturbs the peace--the most used noise abatement tool of State and local police. It must be stated, however, that such nuisance law is difficult to enforce.

Finally, the Environmental Quality Act encourages local agencies to protect the quality of the environment through the Environmental Impact assessment and report process; noise is to be an item considered by such studies.

3. Local Noise Control Options

As managers of transportations systems, local governments may establish limits on the use of such facilities for purposes of noise abatement. For instance, a city may limit speeds on roads and highways under its jurisdiction to limit noise; the faster vehicles travel, the more noise they make. As proprietors of airports, cities and/or counties may be able to impose curfews on airports, but this issue has yet to be resolved in courts.

Local governments may adopt local ordinances to regulate certain types of motor vehicles where powers have not already been preempted by the State or Federal governments. For instance, cities may enact regulations for the operations of off-highway motor vehicles, refuse vehicles, sound trucks, etc. Local ordinances may also control construction noise (time of operation); amplified noise; fixed noise sources in airport, industrial, commercial and residential zones; and loud or unusual noise.

Local governments may also enforce established laws and uniform codes that they adopt. For instance, cities enforce noise abatement provisions of the Vehicle Code and the Penal Code. In addition, the Uniform Building Code adopted by the City sets noise insulation standards for exterior and party walls of dwellings, which local government enforces.

Finally, local government may control noise within its jurisdiction through land use planning practices. As previously stated, land use plans for Airport Influence Areas must be prepared. Similar criteria for noise insulation or land use standards may be applied by the City for land uses near other noise generating transportation components--such as highways and railroads. Environmental Impact Reports may be used as tools to integrate on-site analysis with land use/noise policy, and specify means of mitigating problems.

F. COMMUNITY NOISE STANDARDS

There is a close correlation between land use and the level of noise which is tolerable. We expect residential neighborhoods to be quieter than airports or industrial area. Various land uses may be divided into four categories according to noise sensitivity.

1. Insensitive Land Uses--Noise generally does not affect the successful operation of these particular activities. A wide variety of uses can be included in this category, including public utilities, transportation systems, and other noise-related uses.
2. Moderately Sensitive Land Uses--In noisy environments some degree of noise control must be present if these activities are to be successfully carried out. Included here are general business and recreational uses.
3. Sensitive Uses--In noisy environments lack of noise control may result in annoyance and complaint by residents. This category primarily contains residential uses.
4. Highly Sensitive Uses--In noisy environments a high degree of noise control is necessary for the successful operation of these activities. Examples include hospitals and churches.

A successful noise abatement program requires that standards be easy to interpret and that they be relatively easy to measure with available equipment. The noise quality standards for the City of Bakersfield represent a compromise between what people would like and what they will accept in terms of the noise environment. The standards are related to major land use activities,

in the four categories described above. Examples of the land uses in each category are as follows:

INSENSITIVE LAND USES

Agriculture
Horticulture
Livestock Farms
Forestry
Mining and Extraction
Undeveloped Land
Railways and Terminals
Transit Systems and Terminals
Auto Parking
Raceways and Drag Strips
Motorcycle Parks
Rifle Ranges
Liquid and Solid Waste Facilities
Industrial Manufacturing
Warehousing Utilities
Wrecking and Salvage Yards
Construction Yards

MODERATELY SENSITIVE LAND USES

Country Clubs
Athletic Clubs
Tennis Clubs
Golf Courses and Driving Ranges
Equestrian Clubs
Scientific Testing
Government Services
Lodges, Community Associations
Restaurants and Bars
General Merchandising
Professional Offices
Recreational Vehicle Parks

SENSITIVE LAND USES

Cemeteries
Single-family Dwellings (detached)
Single-family Dwellings (attached)
Multi-family Dwellings (low rise)
Multi-family Dwellings (high rise)
Dormitories
Resort Hotels
Out-Patient Clinics
Preschools
Motor Inns
Hotels
Professional Research
Mobilehome Parks

HIGHLY SENSITIVE LAND USES

Educational Facilities
Hospitals
Convalescent Homes
Wildlife Sanctuaries
Churches
Auditoriums, Concert Halls

The categories indicate only the sensitivity of the use itself to noise, not how noise emitted from the use affects surrounding uses. For example, motorcycle tracks and drag strips themselves are not affected by noise; however, such uses next to a residential neighborhood would have a substantial adverse effect on the residential area.

Noise Quality Standards

The following standards reflect the maximum desired ambient noise levels in the City of Bakersfield:

<u>LAND USE CATEGORY</u>	<u>L50 NOISE</u> <u>LEVEL dB (A)</u>		<u>LDN</u> <u>EQUIVALENT</u>
	<u>DAY</u>	<u>NIGHT</u>	
Insensitive Uses	60	55	70
Moderately Sensitive Uses	55	50	65
Sensitive Uses	50	45	60
Highly Sensitive Uses	45	40	55

G. LOCAL NOISE CONDITIONS

State legislation requiring the preparation of a Noise Element of the General Plan (Government Code Section 65302 (g)) states that noise contours are to be developed for:

1. Highways and freeways
2. Ground rapid transit systems
3. Ground facilities associated with all airports operating under a permit from the State Department of Aeronautics.

It further states that state, local, or private agencies responsible for the construction or maintenance of such transportation facilities are responsible for the submission of information used to develop such contours. The Kern County Health Department, which prepared the noise element studies for KernCOG, acted as a clearinghouse for information disseminated to local governments. The direct source of local noise contour data illustrated by the Noise Contour Map is the Kern County Health Department. The Noise Contour Map is intended for use along with The Community Noise Standards as a "flag" for certain development proposals and the application of noise mitigation policies. The map will be updated from time to time as conditions change. The Noise Contour Map is not, therefore, adopted as Noise Element policy.

H. NOISE ELEMENT POLICY AND PROGRAM RECOMMENDATIONS

1. Law Enforcement

As previously stated, there are currently laws in effect which are intended to control noise and which are enforceable by local government. For instance, the Vehicle Code regulates noise limits for new on- and off-road motor vehicles offered for sale within the State, and noise limits for vehicles on the highways. The Penal Code makes it unlawful for people to operate vehicles on private property, without consent of the owner or lawful occupant. In addition, the Penal Code includes basic nuisance law provisions prohibiting disturbing of the peace by any loud or unusual noise.

It is not believed that a more stringent local noise control ordinance is necessary at this time. The vast majority of existing noise complaints are covered by existing laws, although such laws may be difficult to enforce.

2. Transportation Planning

As indicated by the Noise Contour Map, transportation facilities are the major sources of urban noise. The necessary interrelationships between the Noise Element and the transportation planning is apparent.

Where a new highway or freeway route is being planned, consideration of noise impact should be a major factor in system design. To begin with, noise impacts should be considered when selecting alternative routes; if an economically feasible alternative exists which would impact less area and remain consistent with local planning and urban design goals--that alternative should be given priority. Noise considera-

tions should also dictate, to a reasonable degree, such design considerations as rights-of-way widths, grades, elevations, buffering setbacks, truck routing, and speed limits.

Where existing highways, freeways, or railroads adversely effect neighborhoods with noise, consideration should be given to the construction or development of noise barriers. The construction of solid masonry walls adjacent to roadways have been successful noise barriers in some communities. Earthen berms adjacent to at-grade roadways and railroads may be developed as effective noise barriers.

As previously stated, the State is responsible for noise abatement in schools affected by freeway noise; this program is currently being implemented.

The major obstacle to such remedial efforts is money. For instance, the State Department of Transportation now claims that insufficient funds exist for highway improvement and freeway project throughout the State which have been planned for decades. The railroads have no statutory obligation to construct noise barriers. Neighborhood residents could assess themselves to finance such improvements, but they would have to willingly do so by vote. The City, presumably, could help finance such improvements through its community Development Program but such projects may rank relatively low compared to other pressing demands. The desirability of ultimately constructing such noise barriers may be a desirable long-term objective but the means of implementation must remain uncertain.

3. Local Codes and Noise Dampening

The Building Department plays a major role in reducing the impact of noise on people, through regulating construction practices. Local agencies are now responsible for enforcing Section 1092 of the California Administrative Code, Title 25, which establishes noise insulation requirements for multiple-occupancy dwellings. They are also empowered to adopt a local ordinance with similar requirements for single-family dwellings.

The City of Bakersfield has adopted the 1973 Uniform Building Code (Chapter 35, Appendix) which requires wall and floor-ceiling assemblies separating dwelling units or guest rooms from each and from public space such as interior corridors and service areas to meet specific noise insulation performance standards. Such residential units would include hotels and motels as well as single- and multiple-occupancy dwelling units.

The City should continue to deal with noise problems through enforcement of the Building Code.

4. Land Use and Site Planning

The final recommended strategy for dealing with urban noise problems is through the land use and site planning process. The Noise Contour Map, used along with the Community Noise Standards, identifies areas of potential concern. With proposals for rezoning or subdivisions (defined as discretionary acts subject to the requirements of the California Environmental Quality Act) noise effects should be considered as part of the environmental assessment process.

As previously stated, the Building Code contains provisions to dampen interior noise levels to an acceptable level in many instances; building sound insulation techniques should be considered appropriate mitigation of noise effects. Approaches other than wall or ceiling insulation may include modifying the design scheme to minimize potential noise effects. Appendix A shows a few examples of how adverse noise may be minimized through land use and site planning.

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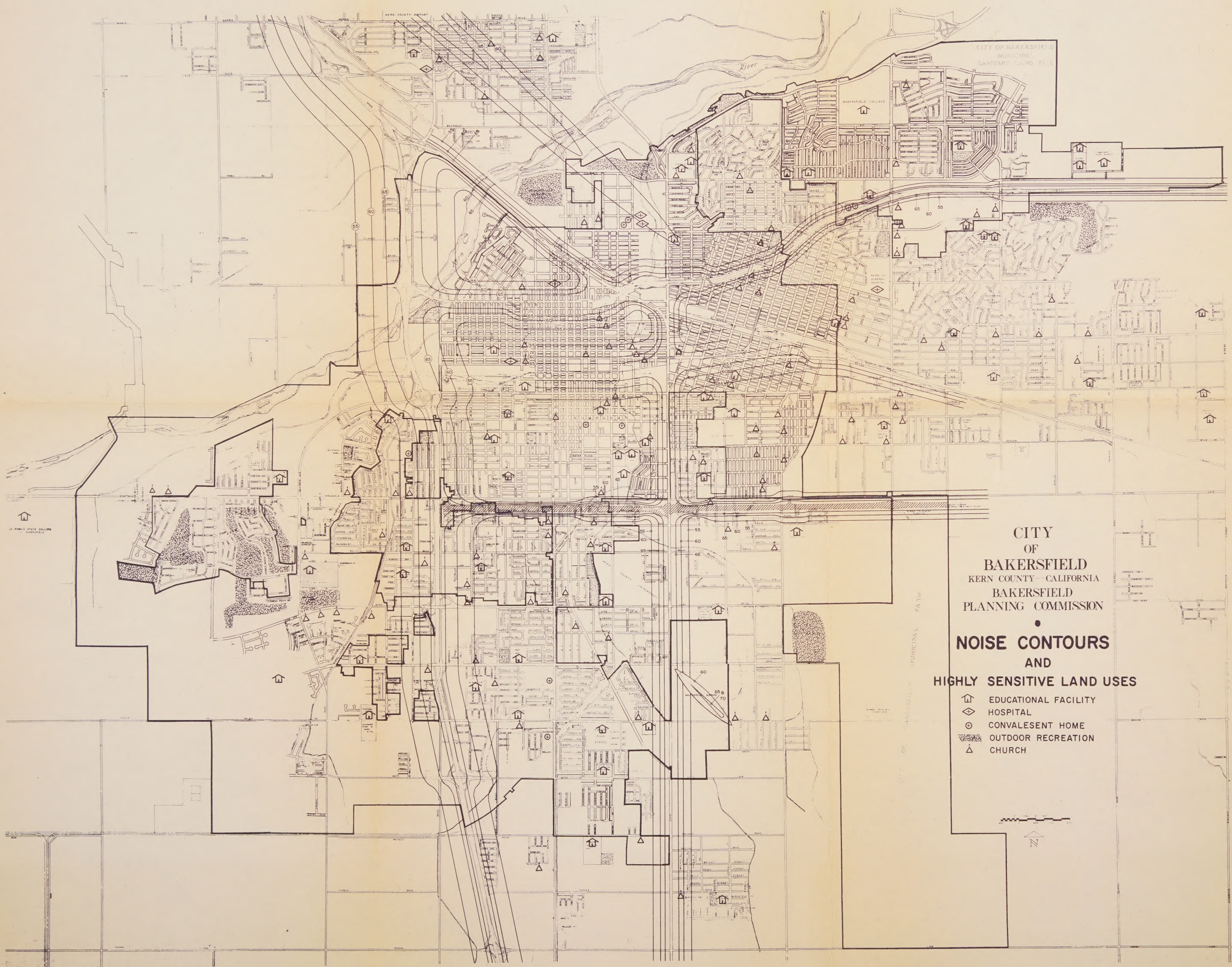
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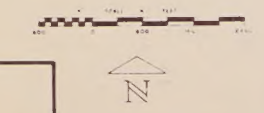
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•
**NOISE CONTOURS
AND
HIGHLY SENSITIVE LAND USES**

- HOUSE EDUCATIONAL FACILITY
- Diamond with cross HOSPITAL
- Circle with cross CONVALESCENT HOME
- Tree OUTDOOR RECREATION
- Triangle CHURCH



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Map insert

